CORPORATE PARTICIPANTS

**Shawn Sweeney**

*Intel-- Business Development: RE-Imagineering the Edge*

**Shane Engle**

*HCL Technologies-- Executive Go-to-Market Expert*

**Renu Navale**

*Intel-- VP, Data Platforms Group General Manager*

................................................................................................................................................................................................................................

PRESENTATION

**Voice-Over**

What do we mean when we say, "All you need is an idea and Intel inside?"

That in today's fast moving high-tech world, big ideas are powered by a one-of-a-kind partnership with Intel, because our customer-first approach is more than just a byline.

From the moment we put the silicon in Silicon Valley, Intel has been accelerating the industry in big ways.

Setting a course for a new era of bold innovation.

No one else is this obsessed with engineering a brighter future.

That's why we're driving the industry's biggest inflection points, putting intelligence where it's needed most, in ways that only Intel can, with the multi-architecture approach that empowers our customers to transform their businesses from the inside out.

We're democratizing AI in big ways, combining software and hardware to open up new possibilities.

And we're moving that innovation around the world at lightning speeds with our advances in 5G.

Collaborating with global operators and creating a new vision for networks of the future.

We're taking intelligence and bringing it to the edge.

Accelerating business outcomes with over 30,000 Edge to Cloud solution deployments.

And we're taking that same innovation to the streets, deploying new technology and advanced data layers to make autonomous driving not only possible, but safe and seamless.

Every day, we create world-changing technology that enriches the lives of every person on earth, making bold moves, because Intel has a unique portfolio breadth and depth, plus the global scale to serve as an unparalleled catalyst, for our partners’ biggest ambitions.

So, if you've got a big idea, let's go off and do something wonderful together.

**Shawn Sweeney**

Welcome, everybody, to the Intel Network Builders Enterprise Networks Insights Series. I am Shawn Sweeney, business development manager here at Intel and host for today's webinar. Thank you for taking the time to join us today for our webinar entitled, Why Edge & AI.

We start today with a presentation by Intel partner HCL, and then we will have a short fireside chat with our presenters.

Before we get started, I want to point out a few features of the BrightTALK tool that may improve your experience. There is a Questions tab below of your viewer. I encourage our live audience to please ask questions at any time. There is also an Attachments tab with additional documentation and reference material which pertain to this presentation. Please take the time to provide feedback and using the survey link. We value your thoughts and we'll use the information to improve future web webinars. Intel Network Builders Enterprise Networks Insights Series takes place live every month, so check the channel to see what is upcoming, and access our growing library of recorded content.

In addition to resources you see here, we also offer a comprehensive NFV and 5G training program through Intel Network Builders University. You can find the link to this program in the Attachments tab as well.

Today, we are pleased to welcome Shane Engle from HCL and Renu Navale from Intel. Shane is a 20-year technology veteran with expertise across domains of IT applications, infrastructure, and IoT. Additionally, Shane has broad experience with IoT, edge and AI, and the transformational power it is bringing to industries. He has helped organizations to implement and scale transformational digital programs that are designed to bring significant improvements to critical KPIs.

Renu Navale is Vice President of Data Platforms Group and General Manager of the Edge Computing and Ecosystem Enabling Division at Intel Corporation. She is responsible for overall strategy, software and platforms that strengthen Intel's presence in the network edge computing business sector.

Welcome, Shane and Renu, and thank you for taking time to join us today.

**Shane Engle**

Sure, Shawn, pleased to be here.

**Shawn Sweeney**

Shane, I will hand it over to you to start off.

**Shane Engle**

Very good. Thank you, Shawn. As we were preparing for this session, I was really thinking about a lot of the customer meetings that I have had over the last year, and a lot of customers are asking us, why is everyone talking about edge and AI, and I think there's some good reasons. There are really some trends that have been happening up until now that have led us to this point. One thing is that while edge and AI have an incredible amount of value and power, really what most enterprises have been focused on over the last four or five years is on the cloud, and the cloud has been a very transformational force for IT. It's allowed IT teams to scale their presence, to scale their data centers. It's allowed telcos service providers to scale mobile edge compute, and really move the computing power closer and closer to where the action is happening. But edge and AI, I think, really bring some capabilities that have been missing from that.

One of the shortcomings of cloud is that it's very expensive, and it's very expensive to store data. It's very expensive to move data into the cloud. And I think over the last four or five years, while companies have been embracing this, they've come to the realization that it is driving up the budgets, and in some cases, my customers have shared with me, they've even exceeded their budget related to cloud. But I think more importantly, there's another shortcoming of cloud computing that really gets in the way of really getting meaningful insights and outcomes, and that is the network latency. You think about moving data from the point of origin into the cloud, and when it's a massive amount of data, the time to get the data to the cloud is very long, calculating the insights takes time, and then finally getting those insights back to the people who desperately need them, I think this has produced a lot of challenges. So, there is an expectation that edge and AI is one of the top 10 trends in technologies that are going to lead companies to capturing even more value and even more transformation.

And I think it was well described in a report recently by Gartner. One of the things I read in this report that I thought was pretty interesting is a prediction that by 2023, 50% of data that is used for computing will be held outside of traditional data centers, and the whole idea here is that data will more and more be held closer to the point of origin, and I think that's a valuable trend, and it's one that edge and AI really can enable. When you think about endpoints like cameras and microphones, and other kinds of sensors, being able to have AI algorithms on board their hardware and being able to calculate those insights, even at the endpoint, that's being done today. And part of the reason that's possible is because of advancements in chips and computing power from Intel-- really, the innovator in this area-- and because the cost of those chips has reached a point where it makes sense, and so now we're doing implementations with customers where there may be three or four algorithms loaded onto an endpoint, which does a few things to really transform the whole situation.

One is it allows you to reduce the cycle time, because if you can take a large amount of data, you can compute that data at the endpoint, and you can turn it into insights, you can provide those insights in a matter of minutes. Whereas in the days when we were using cloud, it might take 30 minutes or even more depending on the size of the data you’re trying to compute. So, I think these trends will really drive a lot of innovation and drive a very decentralized architecture of how these solutions would be implemented.

Another interesting new development is the “far edge” in mobile edge compute provided by telco operators, as an example, has been something that's been happening over the last few years, which was a great trend because it also pushed the data center computing power closer and closer to where the action is happening. But one new innovation that's enabled by Intel and the Smart Edge solution is the idea of a “near edge”, and just imagine in city blocks or in a factory. or in a retail store, you've got edge devices throughout this operation being able to collect data, being able to run AI, being able to make sure that people entering the network are actual valid users, providing a security layer, and even providing some autonomy of processes and things like IT managed services to support all of this infrastructure is really enabled by the “near edge”, and I think that’s an innovation that is going to bring transformation in the years to come.

As an example, one of the solutions that we've developed with Intel and some other partners is around the topic of digital surveillance. If you walk around most cities today, you'll see cameras installed in lots of locations. But the current architecture really is either a closed circuit kind of situation where there's a team of people monitoring that video, like security people or police. Or, in some cases, AI is being used, but like I just mentioned, it's being used in the cloud, and when surveillance is being done, and when police are trying to solve crimes and enhance the public safety, timeliness is of essence to really getting this information. So, being able to run these insights at the edge, and provide insights to police command centers in a matter of minutes, is something that they've never had before. So, we have implemented this approach across a few cities, both in Mexico and also in the US, and in areas where it has been implemented, it has reduced crime by, in some cases, 70% or more, and I think this is really what these departments have told us has been needed really from the beginning.

Another aspect of this is a collaboration with local citizens. And every citizen, if they choose to, can have an app on their phone, where police can push information to them, and they can also return back with information back to the police, and so this has been just incredible, and we're now in the process of rolling this out across the US region, across Latin America, and lots of other regions as well, and the use cases for this aren't just in cities. There are use cases for this in sports arenas, in enterprise business campuses, university campuses, across energy companies, and so forth. Lots of use cases here.

One other example where we've used Intel Smart Edge to bring valuable insights is in the retail industry. One thing that retailers are very hungry to know is how customers are migrating through the stores, what products they're looking at, what products they're buying. They'd love to be able to give cross-sell suggestions to customers as they go through the store, but mostly they'd also like to understand how the checkout lines are queuing up. They'd like to understand how efficient their restocking operations would be, and this can all be enabled through millimeter-wave sensors that we install in stores and connected to Intel Smart Edge. And I think this-- in the few retailers where we've implemented this, they've seen incredible gains and as COVID begins to taper down, and we begin to carry on with our lives, more and more people are going into retail stores, and so this technology is very beneficial to that industry.

Another example in manufacturing where we've used this approach, it was with a company that does contract manufacturing, and within their operations, they have several different customer operations that are set up across a very large campus, and so for each customer operation, they really need to have different kinds of sensors, different kinds of shop floor equipment, but really enabled by a low latency network that can be easily and quickly installed, and then reconfigured as they gain new customers and as they retool for new products. So, this was an interesting project where we partnered with Intel, but also partnered with AT&T, and a few other companies, to establish a private LTE network connected to edge computing. A lot of IoT sensors, different kinds of sensors that would collect images, collect sound data, collect vibration data, and all channeled through the Intel Smart Edge. So, I think this solution really enabled this company to better manage and reconfigure the operations of these, and also to provide a better support model, once the infrastructure was established, to enable some autonomous processes to happen for IT management that can all be enabled on Intel Smart Edge.

Next interesting example of a customer we worked with is a large global maker of earthmoving equipment, and in this business, the value proposition that is most important to this company is to be able to create roads with less and less cycle time, and to really improve the first time success of using this large equipment. And in this case, it was a very difficult piece of equipment for operators called a motor grader, and with this equipment, operators are sitting right above the blade that is earthmoving, and it's very difficult for the operator to see what's really happening. So, we worked with this company to establish a way of collecting image data that could tell the operator what is the angle of the blade, how much material is being displaced, and give them real-time feedback that would tell them if they are going to achieve that first pass success at grading for a road. In this case, Intel Smart Edge was another component of the solution where many sensors, located in different locations throughout this piece of equipment, channeled through Intel Smart Edge, running AI applications and doing all this analysis work that can be provided back to the operators in real-time, and you really couldn't do something like this unless the solution was enabled in real-time.

And then finally, another example I'll give you, before I close here, is for the energy utilities industry. If you know much about electric utilities, they do have power plants, and they also have massive amounts, which spans square miles, of transmission and distribution operations, and this can include substations. It includes poles and electrical lines that go on for miles and miles. And one of the big challenges that they have when they're managing such a large infrastructure is to know when lines are down, to know where the lines are down, and to understand things like how is vegetation going to potentially cause damage. So, we worked with one such energy utility, and with the use of drone technology and image analytics, all linked to artificial intelligence at the edge, we were able to build a solution that allows for easy inspections of different lines, and pinpointing areas where they need to focus their labor-intensive efforts, things like pruning trees. Other preventative things that can be done to keep the grid up and running is enabled by AI at the edge.

So, I've given you a few examples across different industries where this technology has a tangible value proposition. I believe that edge computing and AI is going to be the biggest trend that we see that brings the largest value proposition in the few years to come. So, with that, I'll hand it back over to you, Shawn.

**Shawn Sweeney**

Hey, Shane, thanks a lot. That's a really great presentation, and I loved the customer insights that you bring to the table. Obviously, HCL has a broad portfolio of customers that you've been speaking with. I'd like to bring Renu on board here so that we can do some question and answer, and then also, hopefully spur on some good conversation about the topic.

**Renu Navale**

Thank you. Thank you, Shane, and thanks for this excellent presentation, and I'm really happy to be part of this webinar as well.

**Shawn Sweeney**

Hey, Shane, the first question is, what are the common themes your customers are asking about in the emerging edge applications, and the role AI plays in those? Can you comment on that?

**Shane Engle**

Sure. Most of the companies that we work with, they have operations, most of them are making significant use of cloud computing. Most of them have assets and people who are in the field performing different functions, and what they're really after is a way to drive more efficiency, a way to create more timely insights. I think we've been talking about real-time analytics for a long time, and as it relates to ERP systems and financial data and operational data, in a lot of cases, that data is real-time. But once you move out into the field where the action is really happening, that's where most companies have their most significant operating expense, and they're all looking for ways that they can understand what's happening in the field, and ways that they can improve the outcome, and edge and AI is a common element across all of those.

**Shawn Sweeney**

Thanks for that, Shane. Renu, to you, can you provide some background on how Intel sees the confluence of edge and AI?

**Renu Navale**

Sure, Shawn. If you look at the technology superpowers that Intel CEO Pat Gelsinger keeps talking about, it includes 5G network transformation, artificial intelligence, and also the rise of the intelligent edge. In fact, he refers to these as a key inflection point that’s shaping our future, it's shaping the future of technology, and in particular, edge computing is the conglomeration or the convergence of these super technology powers, which is 5G network transformation, AI, as well as the intelligent edge.

Now we all know that 5G is enabling a future where our compute can be fluid, intelligent, pervasive, and it's delivering a fully connected mobile and smart society. It's, in fact, changing the way we connect with the world, as devices, systems, processes, they all adapt and learn in real-time. Now, AI is yet another significant inflection in this edge game, and together, 5G and AI, I feel like they share almost like a symbiotic relationship that's reinforcing each other. When we think about the combined potential of 5G and AI, it can lead to some previously unimagined levels of insights, efficiencies, as well as revenue for new businesses. And we saw that in several of the examples that Shane shared with us.

So, from faster real-time optimized factories to predictive, you know, retail inventory, to some of the smart city or energy planning, the impact of 5G and AI combined across all of these industries will be truly transformational.

And by allowing these machines to learn, reason, act, and adapt in real world, I really believe 5G and AI are, again, helping these businesses unlock very deep levels of knowledge and insights from massive amounts of data. And for Intel, all of our strategies for edge computing, 5G, and AI, it’s rooted in this fundamental concept that all the use cases that we are seeing, there is incredible value in the convergence of these diverse technologies. So, we’re seeing-- you know, what we’re seeing with every use case almost is this integration of IoT workloads, with AI and computer vision or deep learning inferencing, as well as communication technology workloads such as 5G. And all of this together, this convergence together, I truly believe will deliver some unprecedented value at the edge.

**Shawn Sweeney**

Thank you, Renu, that’s a great lead-in. I was wondering, as kind of a follow-up, do you see any vertical that is leading or if you had to handicap the verticals, you know, which ones are you seeing the most kind of oomph, if you will, related to these technologies?

**Renu Navale**

So, the verticals, which is truly exciting, right, because the verticals are-- you know, also believe in this power of 5G, AI, and edge computing, and the one that I see kind of leading the pack is actually industrial or smart manufacturing or smart factory. The type of business outcome or value that these companies can get with use cases like defect detection, which again uses computer vision, inferencing or AI inferencing, it uses the low latency capabilities from 5G. All of that together is delivering, again, business outcome or business value to smart factories or smart manufacturing.

Some of the other verticals we’re seeing, is now with post-pandemic or post-COVID, which is kind of really picking up is retail, for sure. We’re seeing a lot of interest in retail industries to truly transform how they are approaching their customers or their customer analytics, inventory management, and other types of advertising, real-time advertising. Those are some of the different use cases in retail.

And the one that has surprisingly kind of also picked up is how can we reimagine the use of data for faster diagnosis and other types of applications or value in our life sciences and healthcare use cases. So, again, tremendous amount of opportunity there as well in that industry, where we’re really looking at how can we transform the use of data and the low latency capabilities from 5G, and the ability to derive insights and analysis using AI and deep learning inferencing, how can we truly transform healthcare industry as well.

And there's several others we’re seeing, energy, smart cities, and transportation, ports, and logistics, all of these are different verticals that are looking at how can they adopt 5G, AI, and edge to deliver business outcome or business value to their customers. But the one that I see leading the pack, for sure, is industrial, which is smart manufacturing and smart factories.

**Shawn Sweeney**

Sure. And Shane, you certainly figured those prominently in your remarks. As you look across the heads of all the verticals, could you identify maybe a specific customer pain point, and how Smart Edge helped you solve that?

**Shane Engle**

Sure. You know-- and this one that I’ll tell you is a bit of a complex use case. We do a lot of work with aircraft makers and two of the largest commercial aircraft makers in the world, one is in Europe and the other is in the US, and you know, as we started working with them, I came to understand that on-board every airplane, there's a data center. And to this data center, there is about 2.5 terabytes of data that is created from over a thousand sensors, from nose to tail, wing to wing, collecting data. It’s vibration data, it’s a lot of data that is in the engine telling how the engine is operating. And I was very surprised, it’s in the hydraulics, it’s in the brakes of the aircraft, so much of data. And the only way they could really access it is by plugging in a laptop directly to the airplane.

So, we started working and having a conversation with one of the telco operators, and asking the question, “How could we actually acquire this data while the plane is taxiing, after it lands, and until it’s taxiing to the gate? And if we’re able to acquire it, can we crunch some numbers and can we take a look at how this data could be used to decide what we could do to help this airplane once it’s sitting at the gate”.

Now, I think most airlines, the thing that they struggle with-- and they even have spare aircraft to handle the situation-- is when an aircraft is taken out of operation, it significantly impacts the airlines in their performance, their service levels to customers, all of these things. So, we are helping one of these major commercial aircraft companies take data, funnel it through a private 5G network that can be on a landing, and use it at the edge to calculate repair items that are needed, to calculate how the flight performed and how the pilots were performing, to look at things like fuel economy. And these are just transformational to the airline industry.

And you know, as we all know, that’s an industry that needs a lot of help right now. So, that’s a good example, but I agree with Renu, there are so many examples across retail, life sciences, examples within manufacturing plants, within transportation and logistics that all have tremendous transformational opportunities for us.

**Shawn Sweeney**

Thanks, Shane, that’s great. I guess, to Renu, Intel has been working with partners like HCL to bring Intel products like Smart Edge to customers. Can you speak a little bit about how we go about working with a large and capable worldwide company like HCL?

**Renu Navale**

Sure. So, when we think about, you know, Intel’s history in developing or working with open ecosystems, it’s always been with a fundamental belief that Intel, we can't do this alone, we have to work with a vast ecosystem in order to deliver solutions or drive value to our end customers. And I truly believe that that’s what makes, you know, Intel also unique from a customer standpoint is the way we enable our channel and ecosystem partners, whether it’s through deep, technical collaboration, or through some of our broad scale programs that we use to drive or accelerate adoption and a ready ecosystem.

Now, the collaboration between Intel and HCL, it spans, you know several years, and it spans all the way from cloud to 5G and networking as well as end user computing. And AI and edge, you know-- and this includes AI and edge as well. And we've been successful in establishing, not only deep, technical engagement by investing in various centers of excellence, labs, as well as reference architectures.

Now, we not only collaborate at the hardware ingredient levels with some of our CPUs, as well as our FPGAs for network acceleration, but also higher up in the stack with critical software capabilities where Intel’s offerings, such as Smart Edge, are being leveraged by HCL for private wireless solutions in new markets like North America.

So, we understand that putting together an edge solution is complex, and in order to have successful deployments, system integrators, like HCL, are critical-- are a critical partner for us to drive scale within the industry.

And HCL also is able to leverage some of our scale programs within Intel, such as the Intel Network Builders, our IoT Solutions Alliance, programs such as the Market Ready Solutions, which helps to drive repeatability of that blueprint across multiple customer deployments. And this, ultimately, reduces time to market for our enterprise customers, or it helps accelerate their time to deployments.

**Shawn Sweeney**

That’s great. Shane, picking up on what Renu just went through there, how do you find Intel to work with as a partner, and can you identify one or two of your favorite things about working with Intel in this kind of a realm?

**Shane Engle**

Sure, Shawn, that’s a great question. And you know, as someone who’s been doing this for over 20 years, you know, I have been responsible for and attempted to build partnerships with companies during that time, and some are easier than others, and some are nearly impossible to partner with.

But I can tell you, you know, I was amazed when I first started working with Intel, how eager the company was to help. And not just from a technical, engineering, design perspective, but also from a go-to-market perspective, you know, really wanting to work together and really caring about how we’re bringing value to the customers, and caring about investing in helping to build these capabilities. And it’s not just monetary investment, it’s investment in helping to educate, helping to support, and really in it for the right reasons.

So, I can honestly tell you, Shawn, I think-- and I mean this sincerely and I tell everyone at HCL this is the case-- I think Intel is the best partner that I've ever worked with, and I really appreciate this relationship and I look forward to many, many more years of success in working together.

**Shawn Sweeney**

Well, that’s certainly high praise, Shane, and I know I appreciate it. I'm sure Renu does as well.

**Renu Navale**

Absolutely.

**Shawn Sweeney**

Renu, in terms of ecosystem development, can you speak a little bit more about why systems integrators like HCL, you know, really plug into, and as Shane just related, you know, allow us to kind of earn their trust. Maybe you could give us a little bit more about that.

**Renu Navale**

Yes absolutely. And I think-- you know, I really think it comes from…you used the right words, right, it’s the “trust” in the relationship that is the most critical aspect of our collaboration or our relationship with HCL. The notion that we can't do this alone, we need to partner with-- very closely with companies like HCL to take our products to market, and also making sure that, at the end of the day, we need to ensure we’re delivering value and time to market, with acceleration of time to deployment to our end customers. And by keeping that goal in mind, making sure that, again, we are partnering to achieve that end result for our end customers jointly.

And when we look at our own, you know, the Smart Edge engagements that we have, it started with, you know, Smart Edge is catering to our enterprise customer segment that’s asking for turnkey commercial software from Intel. But we also know that making-- taking this turnkey software, commercial software from Intel and deploying it is very, very complex. And this is where our relationship with HCL becomes very significant.

You know, as an example, not only do we want to drive kind of a direct engagement with HCL, but they can also benefit from our indirect engagements with various OSVs as well as OEMs. So, if we look at, for example, Dell Technologies is in close collaboration with Red Hat, and working also with Intel to-- in order to provide a highly optimized MEC reference architecture or solution, which is featuring best of breed, telecom-grade components for an edge native solution that’s targeting enterprises. And all of these MEC capabilities are powered by Intel Smart Edge commercial software.

However, again, in order to have those solutions, even from our OEMs or our, OSVs deployed is very complex, because you have to pull in many other components and capabilities together, and that’s really where HCL’s capabilities and HCL’s expertise is so critical, because they're able to pull all of these pieces together in a manner that can really work for the end enterprise customers.

So, our strategy has been not only to establish kind of a broad set of channel partners, but to work with application vendor ecosystem partners across a broad range of workloads and verticals. And all of this, again, is to help work with HCL, in partnership, to have them leverage these-- this enabling, this broad enabling for very diverse customer, enterprise customer needs as well.

**Shawn Sweeney**

Thanks, Renu. I'm getting so excited, and what I'd like to do is give you guys-- certainly, you're both infectious in your enthusiasm as well. Shane, could you give me a little bit about what excites you about the prospects for business with Intel and HCL moving forward. What gets you out of bed in the morning?

**Shane Engle**

Sure, Shawn. You know, when you sit back and you think about what is your wildest dream about goals that you can accomplish in your business, value that you can capture that you haven't yet been able to capture. I meet with companies that are manufacturers, retailers, even police departments, Governments, transportation companies, they all care very deeply about continuing to bring value, continuing to lower their cost to serve, improve service. And I think every one of those companies and enterprises has achieved just about as much as they can with the enterprise data that they have.

So, being able to capture this operational kind of data, compute it at the edge, bring the value proposition, automate processes, enable better manageability of all of this infrastructure that’s now being deployed out into the field, I just think this is one of those perfect storm kind of situations.

And so, I'm very excited about the possibilities here and I look forward to waking up every morning, so I can meet with more companies and tell them about this and help them on their journey.

**Shawn Sweeney**

The perfect storm analogy aside, we’re in the right place at the right time, I guess, is what I hear you saying.

**Shane Engle**

Yes, I believe that’s true, Shawn. And I think while there has been a lot of focus on cloud and it certainly is valuable and it has an important role to play, this is really the next extension of being able to accomplish the things that executives need to accomplish.

**Shawn Sweeney**

That’s great, and that’s a great selling proposition.

Renu, same question to you. What excites you about the business opportunity we have in front of us, HCL and Intel?

**Renu Navale**

Absolutely. First of all, when I think about my own career, I-- you know, more than 20 years now-- I'm truly living at the edge right now. When I look back, after I retire, when I look back, I'm going to be very proud of being part of this journey to the edge, because it’s going to be truly transformational across so many industries and across the way we live as well. And that’s what is so exciting for me every day.

I deal with tactical problems, I deal with strategies, but I keep thinking, whatever we’re doing on a daily basis, it’s going to impact or transform many lives and many industries for many years to come.

So, that’s the part of the passion and conviction that excites me the most.

I also believe that this is at the tip of the iceberg, right. When we look at all the use cases, we’re still only in the imagination phase. You know, we've been imaging these use cases in manufacturing, or retail, or healthcare, or energy, or others. We are yet to enter the phase of the reimagination. How are some of these use cases-- some of the industries going to reimagine how they transform themselves?

So, I'm really excited, also, about the future, which is where a lot of these use cases can get reimagined and transformed and, and that’s why I truly believe we’re still at the tip of the iceberg right now.

And then when it comes-- at the end of it all, it’s really about what I call the Three Es. There's Economics, you know, you have to deliver business value, and there has to be business for everybody in the supply chain. There's Experience, which is where, you know-- even Smart Edge we focus so much on client experience and user experience, and delivering those experiences to these various companies or vertical industries. And then the third one, which is kind of the Ease of Use. I mean, we really have to make it so easy for them to adopt all of these technologies, to integrate it into their existing systems or processes. We have to make it really work in a very easy, simple, or easy but managed for all these companies.

So, the Economics, the Experience, and the Ease is really what we need to strive for with edge computing, 5G, and AI.

**Shawn Sweeney**

Living on the edge with the Three Es, who knew? Shane, anything to add to that?

**Shane Engle**

Well, I think it’s the most exciting time to be in this field. I've been responsible for IoT for the last five years at HCL. We saw tremendous growth in that business, but I think where the real significant growth will continue on is really by embracing the edge, the AI, making use of all of that sensor data, and really turning it into meaningful outcomes. I think that’s really what it’s all about, and I think we have every opportunity to do that now.

**Shawn Sweeney**

Well, this has been a great conversation and I really want to thank you both for spending the time with us today. It’s been very educational and certainly very inspirational for me anyway, I really appreciate it.

**Shane Engle**

My pleasure.

**Renu Navale**

Thank you, Shawn, for moderating us and to you, Shane, for an excellent presentation. I really enjoyed this fireside chat as well, and an opportunity to share my passion and my excitement for the future. There's no other place I'd rather be than where I am right now, which is living at the edge.

**Shane Engle**

Yes, agreed, agree. Thank you, Renu.

**Shawn Sweeney**

It really comes across from both of you. I really appreciate your time today again.

Thank you for joining us folks, and please be sure to complete the survey under the Attachments tab. We will use this survey to improve the quality of future webinars.

Again, we appreciate Shane and Renu’s time today, but we most of all appreciate your time today. We realize how valuable your time is and thank you for spending it with us.